

PANEL DATA ANALYSIS: ASSIGNMENT 1

26 November 2024

Time : unlimited hours

Candidates should attempt ALL questions. Marks will be allocated as indicated.

A1. Consider two plots of planted maize, one was applied compound D and the other was organic manure. The effectiveness of fertilizers was assessed by measuring the height of the maize plant 3 times, at 2 weeks, 3 weeks, and 5 weeks. Suppose the agronomist is interested in linear mixed effects with different intercepts and slopes. Using symbols for fixed effects, random effects, and residuals error terms:

- (a) Explain stage 1 for the two-stage analysis model. Please use clear notation making sure that all symbols used are defined. [10]
- (b) Explain stage 2 for the two-stage analysis model. Please use clear notation making sure that all symbols used are defined. [10]
- (c) Derive the general linear fixed effects model from (a) and (b), and use the results to write down the linear average trend for the height of maize plant in a plot with compound D and organic manure. Please use clear notation making sure that all symbols used are defined. [10]

END OF ASSIGNMENT 1 DUE 27 November 2024 16:00